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Director, Safety Division

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Staff Memorandum

To: THE COMMISSION

DOCKET NO. RR-02635B-08-0141

From: Safety Division

Date: April 25, 2008

RE: IN THE MATTER OF THE APPLICATION OF THE CITY OF SURPRISE TO
 UPGRADE AN EXISTING CROSSING OF THE BURLINGTON NORTHERN
 SANTA FE RAILWAY AT DYSART ROAD IN THE CITY OF SURPRISE,
 MARICOPA COUTNY, ARIZONA, AAR/DOT NO. 025-393-G.

Background

On March 7, 2008, the City of Surprise ("City") filed with the Arizona Corporation Commission ("Commission") an application for approval for the Burlington Northern Santa Fe Railroad ("Railroad") to upgrade an existing crossing at the Railroad's tracks at Dysart Road, in Surprise, Arizona at AAR/DOT No. 025-393-G. Commission Safety Division Staff ("Staff") issued data requests and those data requests and the Railroads responses (without attachments), are included as attachments to this memorandum.

The City of Surprise's filing in this application requests approval for the Railroad to upgrade an existing crossing of the Burlington Northern Santa Fe Railroad where Dysart and Grand Avenue intersect with the railroad tracks. The City of Surprise is the road authority for Dysart and ADOT for US-60 (Grand Avenue) for this project. The population of the City of Surprise is 110,000. Flashing lights, bells and automatic gates were first put into service at this location by Commission Decision No. 48770 on 3/14/1978.

On September 12, 2007, Staff, the Railroad, the City of Surprise, and consultants, participated in a diagnostic review of the proposed improvements to Dysart Road. The following is a break down of the crossing in this application, including information about the crossing that was provided to Staff by the City of Surprise and the Railroad.

Arizona Corporation Commission
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Director, Safety Division

Geographical Information

This railroad crossing is located at Dysart Road just north of US-60 (Grand Avenue) in the City of Surprise, Arizona. Dysart Road runs on a North-South trajectory. The rail line runs parallel to Grand Avenue and traverses Dysart Road on a north-west angle. This crossing is located approximately .65 miles south-east of the Grand Avenue/Bell Road intersection. For a map of the area, see Appendix A of this staff report.

Dysart Road

Currently, Dysart Road consists of one lane in each direction with a designated left turn lane and channelized right turn lanes. Approximately 400 feet to the north and 600 feet to the south of Grand Avenue, Dysart Road widens to two-lanes in each direction with a continuous left-turn lane. Curb, gutter and sidewalks are present in most areas. In addition, the crossing currently has the following safety features: automatic incandescent flashing lights, gates, and cantilevers, as well as pavement markings and proper signage. The City is proposing to upgrade the intersection of Dysart and Grand Avenue (US60) by widening Dysart Road to accommodate two through lanes in each direction, a left turn lane in each direction and one right turn lane in each direction. The railroad will install new 12 inch LED flashing lights, and automatic gates in the median, as well as a new concrete crossing surface. Additionally, there will be cantilevers with 12 inch LED flashing lights installed for both directions of traffic. Constant warning time circuitry will also be installed as part of this crossing improvement project. The proposed measures are consistent with safety measures employed at similar at-grade crossings in the state.

Traffic data for Dysart Road was provided by the City of Surprise and was taken in 2006. The ADT counts show 17,600 vehicles south of Grand Avenue on Dysart Road and 19,800 vehicles north of Grand Avenue on Dysart. The projected ADT for 2030 is 28,300 vehicles south of Grand Avenue and 31,850 north of Grand Avenue. The current Level of Service (LOS) indicates a LOS E for the existing roadway. When the proposed improvements are completed, the overall Level of Service will operate at an acceptable LOS C in the year 2026.

Note: The American Association of State Highway and Transportation Officials (AASHTO) Geometric Design of Highways and Streets, 2004, states that the Level of Service characterizes the operating conditions on a facility in terms of traffic performance measures related to speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. This is a measure of roadway congestion ranging from LOS A--least congested--to LOS F--most

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congested. LOS is one of the most common terms used to describe how "good" or how "bad" traffic is projected to be.

The posted speed limit on Dysart Road is 35 MPH. Commission Rail Safety Section, as well as Federal Railroad Administration ("FRA") accident/incident records indicate four accidents on Dysart Road, with seven injuries, and no fatalities. The accidents occurred on the following dates: 9/29/1976, resulting in five injuries, 2/6/1985, with one injury, 2/27/1998, with one injury and 3/3/2000 with no injuries.

Alternative routes from this crossing are as follows; Bell Road is 0.6 miles to the north of Dysart Road. Bell Road is currently an at-grade crossing; however ADOT is currently performing a feasibility study to grade separate Bell Road and the Railroad. The Greenway crossing is 0.9 miles to the south of Dysart and is also an at-grade crossing.

The estimated cost of the proposed railroad crossing upgrade is \$480,310. The City of Surprise and ADOT are sharing the cost of the crossing improvements.

Train Data

Data provided by the railroad regarding train movements through this crossing are as follows:

Train Count: Average of 9 trains per day

Train Speed: 49 mph

Thru Freight/Switching Moves: All train movements through this crossing are thru movements with no switching operations.

Schools and Bus Routes

Information about schools, and school buses, in the area was provided by the City of Surprise. There are two schools near the Dysart Road crossing, they are as follows;

Name	Address	Distance and Direction from Crossing
Surprise Elementary School	12907 W. Greenway Road	1 mile SE
West Point Elementary School	13700 W. Greenway Road	1.5 miles SW

Dysart Unified School District Transportation Department indicates that school buses utilize this crossing an average of 30 times per day.

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Local and Express routes for Valley Metro do not generally utilize this crossing. Route 571 (Express) and the Grand Avenue Limited (Local) get as close as the intersection of Dysart and Greenway, which is approximately 0.65 miles to the south. Only in unique cases of detour would these buses need to utilize this crossing.

Hazardous Materials

Staff asked the City if they knew of any hazardous material traffic across this crossing, and this was their answer:

The City of Surprise has indicated that it is not aware of any specified HAZMAT routes. This means that the crossing in question is not designated as a HAZMAT route. The Arizona Department of Environmental Quality has GIS maps on its website that show hazardous waste generators in the vicinity. The two hospitals in the area, Del E. Webb and Boswell Memorial Hospitals, are designated as Large Quantity Generators of hazardous waste. That waste would likely be transported along Grand Avenue and not utilize the crossing.

Hospitals

There are two hospitals in the near vicinity of this crossing, they are the Del E. Webb Memorial Hospital, 2.5 miles to the north-east, and the Boswell Memorial Hospital, 4.3 miles south-east of the crossing. The City indicated that emergency services vehicles may use this crossing; however a higher quantity of emergency vehicles would probably stay on Grand Avenue since the hospitals are accessed from that road.

Zoning

The City gave the following response as to how the surrounding areas from this crossing are zoned:

There is commercial development on the east side of Dysart Road within the project limits and residential development southwest and northeast of the intersection. A post office with an outside mail drop is located on the west side of Dysart Road north of the tracks and across from the Grand Bell Center Plaza.

The D&D Auto business located on the southeast corner of the intersection continually parks cars on the city right-of-way. The placement of the future sidewalk and part of the northbound right turn lane will be in this area which will eliminate the use of this area for parking.

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The parcel on the southwest quadrant is owned by Lexington Investments, LLC. Lexington Investments has informed the city that they plan on developing their parcel for commercial uses and have submitted plot plans to the city for approval. The southwest quadrant of Dysart Road and Grand Avenue has also been selected for a Park-and-Ride location.

Spur Lines

No spur lines have been removed within the last three years inside a 10 mile radius of the crossing covered in this application.

Grade Separation

With regard to grade separating Dysart Road, the City gave the following response:

First, future traffic volumes do not warrant a grade separation. Currently the Level of Service for this intersection operates at overall Level E; without additional upgrades the Overall Level of service will be at level F by the year 2026. When the proposed improvements are completed, the overall Level of Service will operate at an acceptable Level C in the year 2026. Therefore existing on grade improvements can be completed at a relatively low cost without a bridge. Second, a bridge or other grade separation at this location would have impacts on local businesses. There are several businesses on the east side of Dysart Road which would be impacted by a grade separation structure as shown in Exhibit 2 of the Appendix A. A structure would only encroach on the actual property limits of the businesses, but restricted access to those businesses would result. This would be severely detrimental to the success of their business operations. Finally, access to city and federal buildings would be impacted by a grade separation. There is a city maintenance facility, and a federal Post Office on the west side of Dysart Road and to the north of the railroad crossing. In addition, Arizona Department of Transportation is planning for a grade separation at Bell Road and Grand Avenue, which is ½ a mile north of this intersection.

FHWA GUIDELINES

The Federal Highway Administration (FHWA) Railroad-Highway Grade Crossing Handbook (Revised Second Edition August 2007) provides nine criteria for determining whether highway-rail crossings should be considered for grade separation or otherwise eliminated across the railroad right of way. The Crossing Handbook indicates that grade separation or crossing elimination should be considered whenever one or more of the nine conditions are met. The nine criteria are applied to this crossing application as follows:

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FHWA - GRADE SEPARATION GUIDELINES		
<p>Highway-rail grade crossings should be considered for grade separation or otherwise eliminated across the railroad right of way whenever one or more of the following conditions exist:</p>		
		Dysart Crossing
The highway is a part of the designated Interstate Highway System	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO
The highway is otherwise designed to have full controlled access	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO
The posted highway speed equals or exceeds 70 mph	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO
AADT exceeds 100,000 in urban areas or 50,000 in rural areas	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO
Maximum authorized train speed exceeds 110 mph	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO
An average of 150 or more trains per day or 300 million gross tons/year	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO
Crossing exposure (trains/day x AADT) exceeds 1M in urban or 250k in rural; or passenger train crossing exposure exceeds 800k in urban or 200k in rural	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO
Expected accident frequency for active devices with gates, as calculated by the US DOT Accident Prediction Formula including five-year accident history, exceeds 0.5	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO
Vehicle delay exceeds 40 vehicle hours per day	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO

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Crossing Closures

Given the amount of growth in the area, and the projected future ADT, staff would not recommend a closure of this crossing or any other crossing in the vicinity at this time.

Staff Conclusions

Having reviewed all applicable data, Staff supports the Cities application. Staff believes that the upgrades are in the public interest and are reasonable. Therefore, Staff recommends approval of the Cities application.

A handwritten signature in black ink, appearing to read "Dave Raber".

Dave Raber
Director
Safety Division

A handwritten signature in black ink, appearing to read "Brian H. Lehman".

Brian H. Lehman
Railroad Supervisor
Safety Division



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Executive Director

ARIZONA CORPORATION COMMISSION

March 27, 2008

Suneel Garg, P.E.
City of Surprise Engineering Department
12425 West Bell Road, Suite B-205
Surprise, Arizona 85374

Sent via U.S. Mail & Facsimile to:
(623) 222-3401

Re: Staff's **First** Set of Data Requests to The Burlington Northern & Santa Fe Railway Company
Docket No. RR-02635B-08-0141

Dear Mr. Garg:

Please treat this as Staff's **First** Set of Data Requests to The Burlington Northern & Santa Fe Railway Company in the above matter.

For purposes of this data request set, the words "BNSF," "Company," "you," and "your" refer to The Burlington Northern & Santa Fe Railway Company and any representative, including every person and/or entity acting with, under the control of, or on behalf of The Burlington Northern & Santa Fe Railway Company. For each answer, please identify by name, title, and address each person providing information that forms the basis for the response provided.

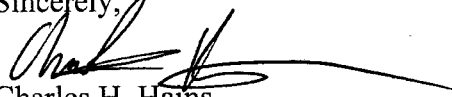
These data requests are continuing, and your answers or any documents supplied in response to these data requests should be supplemented with any additional information or documents that come to your attention after you have provided your initial responses.

Please respond within **twenty-one (21)** calendar days of your receipt of the copy of this letter. However, if you require additional time, please let us know.

Please provide one hard copy as well as searchable PDF, DOC or EXCEL files (via email or electronic media) of the requested data directly to each of the following addressees via overnight delivery services to:

- (1) Chris Watson, Railroad Safety, Arizona Corporation Commission, 2200 North Central Avenue, Suite 300, Phoenix, Arizona 85004.
- (2) Charles H. Hains, Attorney, Arizona Corporation Commission, 1200 West Washington Street, Phoenix, Arizona 85007.

Sincerely,


Charles H. Hains
Attorney, Legal Division
(602) 542-3402

CHH:sab
Enclosure
cc: Chris Watson

**ARIZONA CORPORATION COMMISSION
STAFF'S FIRST SET OF DATA REQUESTS TO
THE BURLINGTON NORTHERN & SANTA FE RAILWAY COMPANY
DOCKET NO. RR-02635B-08-0141
MARCH 27, 2008**

Subject: All information responses should ONLY be provided in searchable PDF, DOC or EXCEL files via email or electronic media.

- CW 1.1 Provide Average Daily Traffic Counts for each of the three locations.
- CW 1.2 Please describe the current Level of Service (LOS) at each intersection.
- CW 1.3 Provide any traffic studies done by the road authorities for each area.
- CW 1.4 Provide distances in miles to the next public crossing on either side of the proposed project location. Are any of these grade separations?
- CW 1.5 How and why was grade separation not decided on at this time? Please provide any studies that were done to support these answers.
- CW 1.6 If this crossing was grade separated, provide a cost estimate of the project.
- CW 1.7 Please describe what the surrounding areas are zoned for near this intersection. i.e. Are there going to be new housing developments, industrial parks etc.
- CW 1.8 Please supply the following: number of daily train movements through the crossing, speed of the trains, and the type of movements being made (i.e. thru freight or switching). Is this a passenger train route?
- CW 1.9 Please provide the names and locations of all schools (elementary, junior high and high school) within the area of the crossing.
- CW 1.10 Please provide school bus route information concerning the crossing, including the number of times a day a school bus crosses this crossing.
- CW 1.11 Please provide information about any hospitals in the area and whether the crossing is used extensively by emergency service vehicles.
- CW 1.12 Please provide total cost of improvements to each crossing.
- CW 1.13 Provide any information as to whether vehicles carrying hazardous materials utilize this crossing and the number of times a day they might cross it.
- CW 1.14 Please provide the posted vehicular speed limit for the roadway.
- CW 1.15 Do any buses (other than school buses) utilize the crossing, and how many times a day do they cross the crossing.

Signal
4 track
\$480,310

**ARIZONA CORPORATION COMMISSION
STAFF'S FIRST SET OF DATA REQUESTS TO
THE BURLINGTON NORTHERN & SANTA FE RAILWAY COMPANY
DOCKET NO. RR-02635B-08-0141
MARCH 27, 2008**

Subject: All information responses should ONLY be provided in searchable PDF, DOC or EXCEL files via email or electronic media.

CW 1.16 Please fill in the attached FHWA Grade Separation Guidelines Table, (from FHWA's 2007 revised second edition Railroad Highway Grade-Crossing Handbook, page 151) with a yes or no answer as to whether each item applies.

FHWA - GRADE SEPARATION GUIDELINES

Highway-rail grade crossings should be considered for grade separation or otherwise eliminated across the railroad right of way whenever one or more of the following conditions exist:

	Crossing 1	Crossing 2	Crossing 3	Crossing 4	Crossing 5	Crossing 6
The highway is a part of the designated Interstate Highway System	Crossing Currently meets the criteria					
	Crossing meets the criteria by 2030					
The highway is otherwise designed to have full controlled access	Crossing Currently meets the criteria					
	Crossing meets the criteria by 2030					
The posted highway speed equals or exceeds 70 mph	Crossing Currently meets the criteria					
	Crossing meets the criteria by 2030					
AADT exceeds 100,000 in urban areas or 50,000 in rural areas	Crossing Currently meets the criteria					
	Crossing meets the criteria by 2030					
Maximum authorized train speed exceeds 110 mph	Crossing Currently meets the criteria					
	Crossing meets the criteria by 2030					
An average of 150 or more trains per day or 300 million gross tons/year	Crossing Currently meets the criteria					
	Crossing meets the criteria by 2030					
Crossing exposure (trains/day x AADT) exceeds 1M in urban or 250k in rural; or passenger train crossing exposure exceeds 800k in urban or 200k in rural	Crossing Currently meets the criteria					
	Crossing meets the criteria by 2030					
Expected accident frequency for active devices with gates, as calculated by the US DOT Accident Prediction Formula including five-year accident history, exceeds 0.5	Crossing Currently meets the criteria					
	Crossing meets the criteria by 2030					
Vehicle delay exceeds 40 vehicle hours per day	Crossing Currently meets the criteria					
	Crossing meets the criteria by 2030					

CW 1.1

The estimated ADT for Dysart Road in 2006 is 17,600 vehicles south of Grand Avenue and 19,800 vehicles north of Grand Avenue

CW 1.2

Currently, the Level of Service for this intersection operates at overall Level E.

CW 1.3

There was a traffic evaluation completed for the preliminary report developed for the project. This was provided with the original application. There are no other known traffic studies by road authorities.

CW 1.4

Bell Road is 0.6 miles from Dysart Road where the proposed crossing is located. Bell Road is currently an at-grade crossing, but there are plans to convert it to a grade separation. The Greenway crossing is 0.9 miles from Dysart is also an at-grade crossing.

CW 1.5

The projected Level of Service will be acceptable and it does not warrant a grade separation. Currently the Level of Service for this intersection operates at overall Level E; without additional upgrades the Overall Level of Service will Level F by the year 2026. When the proposed improvements are completed, the Overall Level of Service will operate at an acceptable Level C in the year 2026.

A bridge or other method of grade separation at this location would have impacts on local businesses. There are several businesses on the east side of Dysart Road which would be impacted by a grade separation structure as shown in Exhibit 2 of the Appendix. Not only would a structure encroach on the actual property limits of the businesses, but restricted access to those businesses would result. This would be severely detrimental to the success of their business operations.

Access to city and federal buildings would be impacted by a grade separation. There is a city maintenance facility, and a Federal Post Office on the west side of Dysart Road and to the north of the railroad crossing.

CW 1.6

(Blank)

CW 1.7

There is commercial development on the east side of Dysart Road within the project limits and residential development southwest and northeast of the intersection. A post office with an outside mail drop is located on the west side of Dysart Road north of the tracks and across from the Grand Bell Center Plaza.

The D&D Auto business located on the southeast corner of the intersection continually parks cars on the city right-of-way. The placement of the future sidewalk and part of the northbound right turn lane will be in this area which will eliminate the use of this area for parking.

The parcel on the southwest quadrant is owned by Lexington Investments, LLC. Lexington Investments has informed the city that they plan on developing their parcel for commercial uses and have submitted plot plans to the city for approval. The southwest quadrant of Dysart Road and Grand Avenue has also been selected for a Park-and-Ride location.

CW 1.8

Data from 2007 shows that there is an average of 9 trains per day moving at 49 mph.

CW 1.9

Name	Address	Distance and Direction from Crossing
Surprise Elementary School	12907 W. Greenway Road	1 mile SE
West Point Elementary School	13700 W. Greenway Road	1.5 miles SW

CW 1.10

Dysart Unified School District Transportation Department indicates that school buses utilize this crossing an average of 30 times per day.

CW 1.11

Name	Address	Distance and Direction from Crossing
Del E. Webb Memorial Hospital	14502 W. Meeker Blvd.	2.5 miles NE
Boswell Memorial Hospital	10401 W. Thunderbird Blvd.	4.3 miles SE

Emergency vehicles may use the crossing; however, a higher quantity of emergency vehicles would probably stay on Grand Avenue since the hospitals are accessed from this road.

CW 1.12

The total intersection improvement project cost is estimated to be \$2,500,000.

CW 1.13

The City of Surprise has indicated that it is not aware of any specified HAZMAT routes. This means that the crossing in question is not designated as a HAZMAT route. The Arizona Department of Environmental Quality has GIS maps on its website that show hazardous waste generators in the vicinity. The two hospitals in the area, Del E. Webb and Boswell Memorial Hospitals, are designated as Large Quantity Generators of hazardous waste. That waste would likely be transported along Grand Avenue and not utilize the crossing.

CW 1.14

The posted speed for Dysart Road is 35 mph.

CW 1.15

Local and Express routes for Valley Metro do not generally utilize this crossing. Route 571 (Express) and the Grand Avenue Limited (Local) get as close as the intersection of Dysart and Greenway, which is approximately 0.65 miles to the south. Only in unique cases of detour would these buses need to utilize this crossing.

CW 1.16

The highway is part of the designated Interstate Highway System	Crossing currently meets the criteria	No
	Crossing meets the criteria by 2030	No
The highway is otherwise designed to have full controlled access	Crossing currently meets the criteria	No
	Crossing meets the criteria by 2030	No
AADT exceeds 100,000 in urban areas or 50,000 in rural areas	Crossing currently meets the criteria	No
	Crossing meets the criteria by 2030	No
Maximum authorized train speed exceeds 110 mph	Crossing currently meets the criteria	No
	Crossing meets the criteria by 2030	No
An average of 150 or more trains per day or 300 million gross tons/year	Crossing currently meets the criteria	No
	Crossing meets the criteria by 2030	No
Crossing exposure (trains/day x AADT) exceeds 1M in urban or 250k in rural or passenger train crossing exposure exceeds 800k in urban or 200k in rural	Crossing currently meets the criteria	No
	Crossing meets the criteria by 2030	No
Expected accident frequency for active devices with gates, as calculated by the US DOT Accident Prediction Formula including five-year accident history, exceeds 0.5	Crossing currently meets the criteria	No
	Crossing meets the criteria by 2030	No
Vehicle delay exceeds 40 vehicle hours per day	Crossing currently meets the criteria	No
	Crossing meets the criteria by 2030	No